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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/822,831	04/02/2001	George Zheng Chen	011765-0280083	8466
909	7590	05/17/2006	EXAMINER	
PILLSBURY WINTHROP SHAW PITTMAN, LLP			CREPEAU, JONATHAN	
P.O. BOX 10500			ART UNIT	
MCLEAN, VA 22102			PAPER NUMBER	
			1746	
DATE MAILED: 05/17/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

5

Office Action Summary	Application No. 09/822,831	Applicant(s) CHEN ET AL.	
	Examiner Jonathan S. Crepeau	Art Unit 1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 and 26 is/are pending in the application.
- 4a) Of the above claim(s) 1-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-24 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 27, 2006 has been entered.

This Office action addresses claims 1-24 and 26. Claims 1-16 remain withdrawn from consideration. Claims 17-24 and 26 remain rejected for substantially the reasons of record. Additionally, a new ground of rejection under 35 USC 103 has been applied to claim 17. This action is non-final.

Claim Rejections - 35 USC § 102

2. Claim 17 is rejected under 35 U.S.C. 102(a) as being anticipated by Chen et al (*Advanced Materials*, 2000). The reference is directed to CNT-PPY composites. The composites are made by an *in situ* polymerization method which results in a product having individual nanotubes coated by PPY. As such, the subject matter of claim 17 is anticipated.

3. Claim 17 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Fan (*Synthetic Metals*, 1999). The reference is directed to carbon nanotube (CNT)-polypyrrole (PPY) composites. The composites are made by an *in situ* polymerization method which results in a product having individual nanotubes coated by PPY (see column 2, first full paragraph). Further, the composite of Fan appears to be “unitary polymer mass” containing plural nanotubes as recited in claim 17. Although the reference does not expressly teach that the polymerization is an electro polymerization, this limitation is a product-by-process limitation and is given little weight since there does not appear to be a difference between the Fan product and the claimed product. See MPEP 2113.

Claim Rejections - 35 USC § 103

4. Claims 18-24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niu (U.S. Patent 6,205,016) in view of Chen et al. or Fan et al.

Niu is directed to an electrochemical capacitor comprising two composite electrodes, each consisting of carbon nanotubes and a conductive polymer (see col. 6, lines 47-50; col. 7, lines 11-15; col. 8, lines 17-21). Regarding claims 18, 19, and 26, conducting members are in contact with the composites (see Fig. 1). An electrolyte separates the first and second electrodes (see col. 9, lines 37-47). Regarding claim 20, the electrically conductive polymers are selected from polyaniline, polypyrrole, polythiophene, and their derivatives (see col. 9, line 5). Regarding claims 21 and 22, the nanotubes may be non-ionized or negatively ionized (i.e.,

oxidized; see col. 14, lines 32-42). Regarding claim 23, the composites are in the form of “thin films” on the conducting members (see col. 9, lines 10-15). Regarding claim 24, the capacitor comprises a cylindrical shape with an insulating member between the rolled electrodes (see col. 11, lines 23-36).

The reference does not expressly teach the process of making the composites as recited in claims 17, 18, and 26, nor the structure implied by the process steps.

As set forth above, both Chen et al. and Fan et al. teach a CNT-PPY composite made by an *in-situ* polymerization process.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to make the composites of Niu by the processes of Chen or Fan. Regarding Chen, in the last paragraph of the article, the reference teaches that a CNT-PPY composite has been synthesized that “has a high concentration of well-dispersed nanotubes that are wetted by the continuous polymer phase.” Further, Chen et al. disclose and teach “the preparation of a remarkably uniform PPy coating on individual CNTs, which promotes controlled modification of the outer surface of CNTs to provide selectable functionalities.” As such, this would motivate the artisan to form the composite of Niu by the process of Chen. Further, Chen teaches that “simple ECPs show interesting physicochemical properties exploitable for batteries, sensors, light-emitting diodes, and electrochromic displays.” Thus, Chen also suggests using the material in a device such as a capacitor.

Regarding the Fan reference, this reference teaches that the conductivity of the CNT-PPY composite is greater than the conductivity of PPY. Further, the reference also contemplates the use of the material in certain devices, teaching that “conducting polymer microtubes have attracted much attention because of the their applications in electronic and electrooptical devices.” As such, the artisan would also be motivated by Fan to make the composite of Niu by an *in situ* polymerization process, and would have a reasonable expectation of success in doing so.

Response to Arguments/Declaration

5. Applicant's arguments filed February 27, 2006 have been fully considered but they are not persuasive. Regarding the Chen et al. publication, Applicants have submitted a declaration under 37 CFR 1.132 in an attempt to remove this reference as prior art. The declaration is successful in establishing that authors Coleby, Dixon, and Zhou did not contribute to the conception of the present invention. However, the declaration is not sufficient to obviate the rejection because the role of instantly named inventor Mark Hughes has not been established. Mr. Hughes is listed as an inventor in the present application but not as an author in the publication. Thus, even with Coleby, Dixon, and Zhou removed from consideration, the authorship of the article (Chen, Shaffer, Fray, and Windle) is different from the inventorship of the instant application (the preceding four plus Hughes). As such, the article and the instant application still have different inventive entities and the article remains applicable under 35 USC 102(a).

Regarding the Fan et al. publication, Applicants state that the reference discloses a chemical polymerization method while claim 17 recites an electro polymerization method. It is then stated that the use of electropolymerization results in a structural difference from the use of chemical polymerization. However, the necessary evidence establishing the difference in the products is still not present, and in addition, the instant specification appears to teach that electropolymerization and chemical polymerization are substantially equivalent. The specification at [0015] states the following: “Two methods of producing the polymersation are described herein for use in this first aspect of the invention. The first is electropolymerisation and the second is slow chemical oxidation to produce a gel.” As such, Applicant’s argument that the two methods inherently produce different structures is not persuasive, in light of both the absence of evidence and the teaching in the instant specification.

Furthermore, the Examiner maintains the position that the only difference between the product of claim 17 and the product of Fan is the size of the product. In the instant specification, Applicants characterize Fan as teaching a “powder” (see [0006]). Claim 17 recites a “unitary polymer mass.” As previously stated, each particle of the powder of Fan can be considered to be its own “unitary polymer mass.” Applicant states that “[e]ven assuming that each powder particle of the composite of Fan et al. were a ‘unitary polymer mass,’ such an interpretation would not anticipate claim 17 as each powder particle would not include discrete nanotubes individually coated in the electronically conducting polymer dispersed therein.” However, the method of Fan appears to produce powders having particles containing plural nanotubes individually coated in the electronically conducting polymer. The record as a whole has not been

developed clearly enough to show that the process of Fan and the process of claim 17 necessarily produce different products. Pursuant to MPEP 2113, once a product appearing to be substantially identical is found and a 35 U.S.C. 102 /103 rejection made, the burden shifts to the applicant to show an unobvious difference. In this case, it is believed that Applicant's burden of showing an unobvious difference between the products still has not been met.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached at (571) 272-1414. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

Art Unit: 1746

system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonathan Crepeau
Primary Examiner
Art Unit 1746
May 12, 2006